

American Welding Society's Certified Welding Technician

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An overview of the requirements for the certification of technicians employed in the welding industry is provided. The education, experience, and examination requirements for certification are presented. The American Welding Society's program is a method for technicians to establish a record of their qualification and abilities in welding industry work.

The American Welding Society (AWS) is an organization of more than 39,000 members with the mission of advancing the science, technology, and application of welding. The structure of AWS includes 27 standing committees, which have differing specific responsibilities but collectively support the overall mission of the society.

One of the standing committees is the Qualification and Certification (Q & C) Committee. This body, composed of volunteers who represent a cross section of the welding industry, has the responsibility of developing specifications and requirements for certification of qualified personnel.

An important role of the society is the certification of individuals who demonstrate proficiency, knowledge, and skill in technical welding careers. In support of this essential function, the Q & C Committee has developed programs for the certification of welding inspectors, technicians, educators, and welders. Several of the programs are well established in this country and abroad, and the others are in the process of being introduced to industry.

Like all documents prepared by AWS, the certification standards are developed by volunteer committee members using a consensus ballot procedure. This process ensures that the requirements fulfill the needs of industry and are fairly applied to all participating parties.

Participants, both corporations and individuals, receive the advantages that a nationally recognized certification program provides. Employers are assured that their personnel have demonstrated their ability by successful performance in a standard examination format. Individuals receive recognition of their abilities, which is an impetus for professional pride and growth.

Since its formation in 1919, AWS has dedicated itself to advancing the science, applications, and technology of welding. Working through the volunteer committee structure of AWS, the Q & C Committee continues to develop certification programs that establish the minimum criteria necessary for the qualification of welding-related personnel.

It is emphasized that AWS is guided by a volunteer base of members working by consensus to establish the various certification programs available to the welding community.

The basis for the establishment of a particular certification program is a survey of the industry that uses this particular individual. By using the data base available, from the membership or a specific industry, the survey can provide the usage, need, duties, tasks, and responsibilities of particular individuals.

The basis and documented need for the welding technician program began in 1976, when the Q & C Committee established five major areas of certification needs for the welding industry: welders, inspectors, technicians, laboratories, and educators.

Initially, the certified welding inspector was chosen to lead the field and provide guidance in the areas of safety, health, and expertise in this certification endeavor. Following were the AWS Certified Welders Standard and the AWS Standard for Accreditation of Test Facilities. Recently approved and published was the AWS Standard for Certification of Welding Educators. Each standard specifies the requirements and rationale for AWS certification in each field.

The Q & C Committee, after careful review of the data provided by individuals involved in the survey of welding technicians, believes that the welding technician program can provide the documentation necessary in the welding community.

AWS's Q & C Committee identified the welding technician as a critical certification program that is needed to communicate between welding engineers and production personnel. This level is perceived as the individual who works with the engineers in reviewing contracts, drawings, and technical literature and in preparing welding procedure specifications, procedure qualification reports, and production sequences. The technician is also a troubleshooter for production problems, the "go-between" for the welding engineer and production personnel. Therefore, the welding technician must be capable of effectively communicating with the engineer as well as production personnel. For problem solving, the welding technician must be capable of performing actual welding in the production environment.

AWS's Q & C Committee defines the welding technician as a person who determines weldment requirements from a specific code, standard, or specification. The welding technician either prepares or reviews written instructions for the production of weldments. The welding technician must be thoroughly familiar with various aspects of fabrication and assembly, including codes, standards, specifications, base materials, filler materials, heat treatment, mechanical properties,

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inspection methods, acceptance standards, tests, welder qualification requirements, fabrication tolerances, and welding process and procedures.

The welding technician shall also prepare and produce reports that reflect professional judgments (e.g., weld failure findings). For the welding technician to be effective, the activities performed shall be consistent with specified requirements and technical and ethical principles. The welding technician should be able to work with the professional engineer or a welder and appreciate the role of each in the development of weldments.

Responding to requests from American industry, a national survey was conducted in summer 1987. The results of the welding technician survey indicated that 74.8 percent of the 517 respondents would support a welding technician qualification/certification program.

The following summarizes the national survey's results:

1. Does your organization (select the most applicable)
 - A. Specify welding requirements (17.7 percent)
 - B. Make welding equipment/filler metal (10.4 percent)
 - C. Supervise and direct welding (13.8 percent)
 - D. Inspect or test welding (14.8 percent)
 - E. Consult concerning welding (16.6 percent)
 - F. Manufacture welded products (15.9 percent)
 - G. Other (please define) (10.9 percent)
2. Does your organization
 - A. Prepare written welding procedure specifications (36.4 percent)
 - B. Prepare drawings for weldments (18.6 percent)
 - C. Procure welding services (8.7 percent)
 - D. Qualify welders (20.1 percent)
 - E. Other (please define) (16.2 percent)
3. The position description
 - A. Meets your organization's needs (19.5 percent)
 - B. Defines a position used by your company (11.3 percent)
 - C. Misses the point (3.8 percent)
 - D. Is approximately accurate (38.4 percent)
 - E. Is not applicable to your company (27.0 percent)
4. Does your organization support the concept of qualification and certification of welding technicians?
 - A. Fully (36.6 percent)
 - B. Somewhat (17.9 percent)
 - C. Maybe (12.0 percent)
 - D. In some departments (8.3 percent)
 - E. Not required normally (21.5 percent)
 - F. It's total useless (3.7 percent)
5. Should the American Welding Society work in cooperation with the American Society of Certified Engineering Technicians?
 - A. Yes (42.2 percent)
 - B. No (10.4 percent)
 - C. No opinion (47.2 percent)
6. How much experience should an engineering technician have before applying for certification?
 - A. 1 year or more (17.2 percent)
 - B. 5 years or more (68.3 percent)
 - C. 7 years or more (10.7 percent)
 - D. 10 years or more (2.9 percent)
 - E. 15 years or more (1.0 percent)

7. Should a technician have been a certified welder?
 - A. Yes (33.0 percent)
 - B. No (7.2 percent)
 - C. Technicians' work can be done without the physical ability to weld (5.5 percent)
 - D. Welding ability is helpful but not needed (13.9 percent)
 - E. Welding ability is required but certification is not necessary (40.4 percent)
8. Does your organization use the technician as
 - A. Planner/preparer before work starts (7.6 percent)
 - B. Troubleshooter after the fact (12.9 percent)
 - C. About equally in both areas (79.5 percent)
9. What should be the minimum educational level required for a certified technician?
 - A. Eighth grade (2.3 percent)
 - B. High school or GED (73.3 percent)
 - C. Two years of college (24.4 percent)
10. Should an examination, like a professional engineers' examination, be used to certify technicians?
 - A. Yes (23.2 percent)
 - B. No (12.3 percent)
 - C. Yes, but directed at practical problems (48.5 percent)
 - D. A verified resume of satisfactory work experience is all that is required (16.0 percent)

As a result of the positive response to the survey from American industry, AWS's Q & C Committee initiated AWS QC-5, Standard for AWS Certification of Welding Technicians.

AWS QC-5 establishes the requirements for AWS certification of welding technicians. It describes how personnel are qualified, the principles of conduct, and practices by which certification may be maintained. It is intended that this standard supplement the minimum requirements of an employer, code, standard, or other documents. It is also intended that this standard will not be construed as a preemption of the employer's responsibility for the work or for the performance of the work performed by the welding technician.

AWS QC-5 established two levels of certification: "certified welding technician" and "certified welding technician in training."

The certified welding technician has the responsibility of directing operations associated with weldments that are completed in accordance with the appropriate contract documents, codes, and standards to produce a satisfactory product. The welding technician's activities begin before production work, continue through the production process, and do not end until after the production process is completed.

The certified welding technician in training has the responsibility of directing, under the direction of the certified welding technician, operations associated with weldments that are completed in accordance with appropriate contract documents, codes, and standards to produce a satisfactory product. The certified welding technician in training shall begin activities and continue through the production as directed by the certified welding technician.

A certified welding technician will be able to perform the following activities:

- The welding technician shall be capable of reading and interpreting drawings, specifications, and contract documents.

- The welding technician reviews the materials being specified to determine whether they comply with the requirements of the codes, standards, or other documents. The base materials and filler metals both require review for the weldability.

- The welding technician defines the appropriate welding processes and equipment to be used to comply with the written welding procedure specification. The welding technician shall be familiar with the welding process and understand the equipment inherent in that process. He shall verify that the fabricator or contractor is properly using equipment for the appropriate application. The welding technician should be capable of troubleshooting welding equipment.

- Written welding procedure specifications are required for most applications. The welding technician should review the specifications to determine whether they comply with the appropriate code, standard, or contract documents. The welding technician may write new welding procedure specifications. He may be required to define testing requirements to qualify welding procedure specifications. He should be responsible for preparing procedure qualification reports or review them for conformance to code, standard, or other documents.

- The welding technician may review the qualification data presented for welders, welding operators, and tackers to verify that they are properly qualified in accordance with applicable codes, standards, or contract documents. The welding technician should require requalification of welders if there is evidence that a welder's or welding operator's work does not conform to the applicable code, standard, or contract documents. The welding technician may specify tests that will properly qualify welders for the production.

- The welding technician reviews and verifies that the work being completed follows the instructions included in the welding procedure specification. She verifies that the joint preparation fit requirements comply with the drawings and welding procedure specifications. She reviews the use and control of filler metals in production facilities. The welding technician uses these reviews to correct problems.

- The technician shall be capable of performing informal visual inspections of the completed weldments for feedback information to determine whether they comply with the appropriate codes, standards, or contract documents. He examines the welds to ensure that they are the proper size, length, and do not have any discontinuities that exceed the acceptance criteria contained in various codes and contract documents that apply to the production work.

- The welding technician may verify that all required examinations of welds that are defined and specified have been completed. Various code standards and contract documents

will require nondestructive or destructive examination of welds, including hydrostatic testing of vessels and other leak detection methods.

- The welding technician is responsible for clear and concise reports, records of reviews, inspection results, and performance data.

Required experience that a certified welding technician should have includes not less than 1 year of welding experience in the operation of welding equipment and 4 years of experience in an occupation function that has a direct relationship to weldments fabricated to a code or standard and directly involved in one or more of the following:

- Design—preparation of plans and drawings for weldments;
- Production—planning and control of welding materials, welding procedures, and welding operations for weldments;
- Construction—fabrication and erection of weldments;
- Inspection—detection and measurement of weld discontinuities and verification of fabrication requirements; and
- Repair—repair of defective welds.

The required experience for certified welding technician in training will include not less than 2 years of experience in an occupation function that has a direct relationship to weldments fabricated to a code or standard and directly involved in one or more of the previously mentioned areas.

A high school diploma is the base educational requirement for both the certified welding technician and the certified welding technician in training. However, the standard contains provisions for educational levels less and greater than a high school diploma.

A written examination is required for the certified welding technician and the certified welding technician in training. A two-part examination consisting of welding technology fundamentals and a practical portion is proposed.

AWS will issue to each certified welding technician and certified welding technician in training applicant who complies with the requirements of the standard a serialized certificate and a wallet card stating that the applicant has met AWS's certification requirements. The certification will be valid for 4 years unless revoked for reasons defined by the standard.

In conclusion, AWS's program for certification of welding technicians has been developed to define minimum standards for persons performing these tasks and to provide a means of recognizing those who have the knowledge, qualification, experience, and expertise in the field of welding development, applications, and problem solving.

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